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POWDERY MILDEW OF ROSES

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Powdery mildew is a serious rose disease, and when discovered in a planting, something should be done immediately to check its further spread. The many varieties differ considerably in resistance to the disease, although nearly all roses are more or less susceptible. Such varieties as the Dorothy Perkins and Crimson Rambler are particularly susceptible, whereas the following have proved fairly resistant: TEAS, Maman Cochet and Alexander Hill Gray; HYBRID TEAS, Antoine Rivoire and Joseph Hill; POLYANTHA, Cecile Brunner; and CLIMBERS, American Pillar and Dr. Van Fleet. This disease is most likely to appear during the spring and fall.

Cause.—Two powdery mildew fungi are known to attack roses, although one of these* is generally found to be the more frequent cause of the disease. In the presence of sufficient moisture, spores on the leaves, stems or blossoms germinate, and the growth therefrom soon results in a network of slender branching threads over the surface. Some branches of the fungus penetrate into the host tissue and absorb nourishment to sustain themselves. The attacked cells swell, causing distortion of the affected parts, and soon die. In addition, upright branches of the fungus are produced which bud off countless numbers of colorless, oval-shaped spores. The accumulation of these vegetative parts and spores of the fungus on the surface of the plant causes the whitish powdery appearance from which the disease derives its name. After a destructive vegetative period, the fungus sometimes forms a second type of fruiting structure which, when mature and abundant, appears as tiny, black dots scattered over the network of threads. Within these black fruiting bodies is produced a second type of spore which is resistant to cold and other environmental conditions unfavorable to vegetative parts of the fungus. However, because of the moderate temperatures in this State, the fungus may winter over in either stage of development.

**Sphaerotheca pannosa* (Wallr.) Lev.

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Symptoms.—The disease first appears as grayish or whitish spots on young leaves and shoots. These spots become raised and blister-like, particularly on the younger tissues. Under humid and poorly ventilated conditions the disease develops rapidly, and soon the leaves, young stems, thorns, and buds become more or less covered with the white, powdery growth of the invading fungus. Frequently, young leafy shoots or other parts of the plant become completely coated. Portions of infected plants or at times entire plants appear as though dusted with some white powder. Dwarfing, curling, and other malformations of leaves, stems, and buds develop, and soon the infected tissues become parched and brown. Affected buds of the Dorothy Perkins and Rambler varieties often fail to open. In advanced stages of the disease the white, mildewed appearance becomes less conspicuous or entirely lost. While defoliation and other injuries caused may weaken the plants seriously, death seldom results immediately.

Control.—Good ventilation is important in the prevention of powdery mildew. Plants pruned to an open type of growth, well spaced, and set away from walls or buildings dry quickly and are less affected. The less susceptible varieties should be selected whenever practicable.

Since the greater portion of the powdery mildew fungus is on the outside of the host plant, it is highly vulnerable to fungicide applications, and may be eradicated from diseased parts after once becoming established. Immediately upon discovery, the diseased bush, as well as all bushes situated nearby, should be completely covered with a suitable fungicide. Additional applications should be made at weekly intervals until no new signs of the disease are apparent. Two or three applications are usually sufficient.

Sulfur and sulfur compounds have proved particularly effective in combating this disease. If either sulfur or copper fungicides have been applied regularly to control other diseases, powdery mildew is not likely to appear. Many suitable sulfurs are available for application either as dusts or sprays. The dusts are generally more satisfactory, and for effectiveness as well as ease in applying light, thorough applications, they should be mostly of 300-mesh fineness. They may be obtained either with or without arsenicals or nicotine added and in either the yellow or green-colored forms. The difficulty of applying dusts on windy days may often be avoided by applying them early or late in the day. The list of effective sprays would include the wettable sulfurs (strength as recommended by the manufacturer), lime-sulfur (8 ounces per 5 gallons of water) and potassium sulfide (1 ounce per 3 gallons of water). Since sulfur sprays and dusts sometimes cause severe foliage injury when applied during hot weather, they should be used with caution at such times. Applications made late or early in the day would be less likely to burn. The foliage may be either wet or dry, although dry foliage permits better coverage with the dusts.